Genetic Rescue Working Group

The discussion has previously centered on high-profile, *long-extinct* examples such as the mammoth. However, this working group decided to abandon the term de-extinction and to adopt its objective: the use of techniques designed to recover long-extinct species and – most relevant to today's purpose – those on the brink of extinction. The group chose *genetic rescue* as the term to identify the core objective.

For purposes of this discussion, GENETIC RESCUE is defined as *an increase in population-level viability through the re-introduction of previously lost genetic material by cell-based human intervention.*

Genetic rescue involves utilizing preserved and banked tissue samples, both reproductive and somatic across a variety of technological means to add genetic diversity and/or producing viable offspring for critically endangered animals and plants. They include artificial insemination, *in vitro* fertilization, etc., along with induced stem cell development and applications of cloning technology.

Historically, the movement of whole, living animals has been the means for restoring and rejuvenating declining populations. In cases where this has become impossible, genetic rescue potentially restores viability.

These technologies have been proven in principle; and the next stage is to develop practical applications for chosen species. This working group decided that it should be made a priority and actions taken to advance our capabilities now.

Rationale – Genetic Rescue is the response to an extinction crisis. It has the greatest potential for impact where traditional means of species recovery by live animal transfer are not practical or possible. Emerging technologies in genetics and assisted reproduction will be crucial for some species' sustainability.

Numerous challenges exist in moving from proof of principle to making these technologies practicable. Two examples are methods of species choice for rescue, and another is the lack of availability of suitable samples.

Prioritization – One must consider the following factors when choosing species to rescue: Geography, Taxonomy, Threat/Risk, Opportunity (availability of samples, accessibility to storage).

Considerations for implementation strategy:

- Probability of increasing the species viability
- Conservation opportunity
- Timing, relative to population demography
- Range size versus population size
- Use the Red List

No single set of priorities can be applied to all cases.

Action outcomes:

- Request CBSG to communicate to the wider SSC – particularly the Conservation Genetics Specialist Group – the potential of using genetic rescue techniques for species presently at immediate risk of extinction and for those known to be potentially at risk.
- Using CBSG community and regional zoo association networks as launch platforms, communicate and coordinate a campaign (Myfanwy Griffith) to encourage and enable zoos to collect, preserve and bank cell samples for a much wider species in greater numbers.
- Establish a decision framework (Dalia Conde & Johanna Staerk) to enable the most appropriate choices of species for genetic rescue.
- Establish a database for banked specimens (Dalia Conde & Oliver Ryder).

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